

Serial No. 10/743,070
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SHI.036CON

AMENDMENTS TO THE CLAIMS:

1. (Previously Presented) A high pressure discharge lamp, comprising:

a pair of electrodes disposed in a bulb opposite each other and each electrode of said pair of electrodes being connected to one of a pair of conductive elements which are sealed at a sealing portion of said bulb,

wherein a part of each electrode of said pair of electrodes is sealed within said sealing portion to form a contacting portion formed by the part of each electrode of said pair of electrodes in physical contact with a material of said bulb, and

a maximum length L_{\max} , of the contacting portion is defined as:

$$L_{\max} (\text{mm}) \leq 200 / (P \times D); \text{ and}$$

a minimum length, L_{\min} , of the contacting portion is defined as:

$$L_{\min} (\text{mm}) \geq 0.8 / (D^2 \times \pi) \text{ or}$$

$$L_{\min} (\text{mm}) \geq 0.7 \text{ whichever is longer,}$$

where D is the diameter (mm) of the corresponding electrode of said pair of electrodes and P is the power (W) supplied to the corresponding electrode of said pair of electrodes, and

wherein said contacting portion terminates inside and beyond an edge of one of said pair of conductive elements.

2. (Previously Presented) The high pressure discharge lamp according to claim 1, wherein said pair of conductive elements comprises molybdenum foils.

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3. (Previously Presented) The high pressure discharge lamp according to claim 1, wherein the maximum value R_{\max} , of the surface roughness of said pair of electrodes at the contacting portion of about 5 μm or less, where R_{\max} is the maximum of the absolute value of the difference between the distance from the axial center of each of said electrodes to a particular point on the surface of each of said electrodes and the mean value of the distance.
4. (Previously Presented) The high pressure discharge lamp according to claim 2, wherein the maximum value, R_{\max} , of the surface roughness of said pair of electrodes at the contacting portion is in the range between about 2 μm and 3 μm .
5. (Canceled)
6. (Previously Presented) A high pressure discharge lamp, comprising:
a pair of electrodes, disposed in a bulb opposite each other and each of said pair of electrodes being connected to one of a pair of conductive elements which are sealed at a sealing portion of said bulb,
wherein a part of each electrode of said pair of electrodes is sealed within said sealing portion to form a contacting portion formed by the part of each electrode of said pair of electrodes in physical contact with a material of said bulb,
wherein R_{\max} of the contacting portion of each of said electrodes is about 5 μm or less, wherein R_{\max} is a maximum of an absolute value of a difference between a distance from an

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axial center of each of said electrodes to a particular point on a surface of each of said electrodes and a mean value of the distance, and

wherein said contacting portion terminates inside and beyond an edge of one of said pair of conductive elements.

7. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein said pair of conductive elements comprises molybdenum foils.
8. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein a length of said contacting portion of each of said electrodes is in a range between about $P/150$ and $P/100$ mm from an end of each of said electrodes along the length of each of said electrodes, where P is a supplied power to said high pressure discharge lamp in watts.
9. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein a maximum value of a surface roughness of the contacting portion of each of said electrodes is about $3\mu\text{m}$ or less.
10. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein a maximum value of a surface roughness of the contacting portion of each of said electrodes is about $1\mu\text{m}$ or less.

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11. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein a maximum value of a surface roughness of the contacting portion of each of said electrodes is about $0.5\mu\text{m}$ or less.
- 12 – 13 (Canceled)
14. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein mercury vapor is contained in the high pressure discharge lamp in an amount between about 0.12 and 0.3 mg/mm^3 .
15. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein a halogen gas is contained in the high pressure discharge lamp in an amount between about 10^{-8} and 10^{-2} mol/mm^3 .
16. (Previously Presented) The high pressure lamp according to claim 6, wherein an inert gas is contained in the high pressure discharge lamp with a pressure of about 6 kPa or more.
17. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein said pair of electrodes comprises tungsten containing potassium oxide.

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18. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein the bulb wall loading in the high pressure discharge lamp is about 0.8 W/mm^2 or more.
19. (Previously Presented) The high pressure discharge lamp according to claim 6, wherein the contacting portion of each of said electrodes has a surface, and said surface is polished by a composite electrolytic polishing method.
20. (Previously Presented) The high pressure discharge lamp according to claim 1, wherein said high pressure discharge lamp comprises an internal pressure of at least 8 MPa.
21. (Previously Presented) The high pressure discharge lamp according to claim 1, wherein a distance between said each electrode is in a range from 1.0 to 2.0 mm.
22. (canceled)
23. (Previously Presented) The high pressure discharge lamp according to claim 1, wherein said contacting portion covers a distance L from the end of the sealing portion to an end of the electrode terminating inside and beyond the edge of one of said pair of conductive elements.

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24. (Currently Amended) The high pressure discharge lamp according to claim 6, wherein said contacting portion covers a distance from the end of the sealing portion to an end of the electrode terminating inside and beyond the edge of one of said pair of conductive ~~elements~~ elements.